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Conceptualizing Academic Mobility e-Service through the Understanding of Service Relationships

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Abstract

Higher education is facing the challenge of providing a flexible education curriculum that offers academic mobility for students of higher learning. As the popularity of academic program increases, the services rendered for academic mobility is expected to scale up when the demand for academic mobility program increases. To meet this increased demand, the offering of e-services for academic mobility may ease the processing and simultaneously offer potential students information and application support to embark on an academic mobility program. This paper reports on the early effort to conceptualize an academic mobility e-service to gain a good understanding of the underlying service systems requirement. The service system concept by Steven Alter is used in conceptualizing the service relationship. A stakeholder interview with academic mobility service providers and their students who had undergone an academic mobility program was conducted. A thematic analysis on the interview data was conducted and used to illustrate the service relationships and the service triangle between the academic mobility service providers and their customers.

Keywords: service systems, service science, higher education service

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1. Introduction

The university academic system has evolved into a flexible education system [1]. Universities are now required to be adaptive in the ever-changing education environment where the globalization of education demands for the students to be equipped with international exposure. Transnational academic mobility promotes the idea of academic movement transcending across the national boundaries. It emphasizes on individuals and movements which occurs in transnational space [2]. The numbers of students participating in mobility programs has increased by 50% during the period from the year 2000 to 2005 [2]. The forecast of global student mobility projected in 2025 is 3.72 million increases from 2.173 million in 2005 [3]. In support of the expansion of transnational academic mobility, university's academic business process must now include service support for academic mobility which may scale up to a level that cannot be catered by the current work system.

This paper attempts to describe the phenomena underlying academic mobility services by analyzing the existing manual process through the work systems view of academic mobility. In our approach, we conceptualize the academic mobility e-service by applying the conceptual model of service relationship and service triangle by [4] [5]. In the following sections of the paper we discussed the work leading to the conceptualization of academic mobility e-service.

2. University as an Enterprise

The era of globalization has challenged universities to change their traditional provision of higher education. The changing environment generally poses issues of delivery and content and the blurring borders between the profit-oriented universities and traditional non-profit universities as they compete to remain in the higher education industry [6]. Higher education is now seen as a service industry and new thinking modes have been invoked. This has led to the adoption of disruptive technologies and new operational systems that allow universities to compete with other higher education providers through value creation activities for their customers and stakeholders [7]. Higher education has extended the exchange of value between the educator and the students which can be seen in most teaching universities by replacing with other value-creating activities [8]. From being a state or government funded not-for-profit universities, now the role is replaced by self-funded-for-profit one in order to support their other academic activities [7]. The fast pace and scale of globalization has further increased the complexity of higher education providers' environment. They are now taking steps to increasingly employing modern concepts of management and administration for professionally managing their organizations to compete in the vibrant and volatile environment [9].

Universities now face issues of their sustainability and need to seek for other initiatives to support their survival. As financial aids decrease universities have to look for alternative sources to survive. Without the affluence of students, university may have difficulty coping with operational costs [10]. The increasing demand from insightful students has also forced the strategic management of universities to critically balance between the needs of the financial giver and also the ranking agencies to maintain the university reputation [8]. We now witness the transformation of universities into competitive enterprises.

2.1. Students Academic Mobility

The Bologna Process was signed in 1999 with the aim of creating a European Higher Education Area based on international cooperation and academic exchange that is attractive to European students and staff. The process has been borrowed and implemented by various international regions beyond Europe [11]. Academic mobility (AM) is one of the internationalization efforts undertaken by the university to strengthen

university competitiveness in the higher education industry. Research on AM is seen in the studies of the social and financial aspects of academic mobility and its impacts [12]. However, no work is seen in the provision of the AM service. In facilitating the students' AM programs, universities have to handle services comprising a plethora of tasks as the complexity of AM emerges from the interactions between various stakeholders involved in the provision of the service.

AM is refers to higher education students physical movement in or out of another institution in their own country or in other countries to continue their study for a limited time. The key criterion of AM program is its duration [12]. The students are allowed to study in limited time of not more than one year or two academic semesters. In addition, issues may arise from the two perspectives of AM. The first is the inbound perspective involving the university from the receiving county (host) and the second is the outbound perspective involving the university form the sending country (home).

AM is the most visible part of the internationalization tertiary education [12] [13] and offers value for both the education provider and the education customer. In students' AM, the students who are the education customers gain an opportunity to engage in a short-term internationalization experience that can help shape them into T-shaped person [14]. In addition, by participating in AM program, students gain the opportunity to access knowledge experts worldwide by enrolling into classes of these experts [15]. For the education provider, that is the universities, engaging in AM programs is a means to gain competitive advantage as universities are seen to be taking the positive move to prepare students to face globalization. Governments have also embraced AM in its higher education initiatives and several public and private universities have supported by embarking on students' AM programs. Plenty of benefits gained by the students and the organizations have witnessed to the changing trend of transnational AM in most of international students from mainly choosing Europe and United Kingdom as their study destinations in 1970s and 1980s, towards countries with emerging economy within the Asia-Pacific region as viable alternative choices [16].

A university engaged in an AM has to cater for the needs of both inbound and outbound students while abiding to the regulation and restrictions imposed by stakeholders of the mobility program. Universities that are in the infancy stage of the mobility programs may be offering the service via manual work systems. However, when mobility programs gain popularity, the demand for them is expected to scale up and may poses issues of operational inefficiency. The adoption of ICT in the academic mobility service can lead to the provision of a new e-service that we named as the academic mobility e-service.

In realization of an academic mobility e-service, the next section will discuss on the conceptualization of AM which is imperative in terms of the:

1. Relationship of service system, information system and work system.
2. Service relationship represented as service triangle.

3. Understanding Academic Mobility as Service System

This section attempts to describe academic mobility service from service system perspective. Relationship between service, information systems and work systems will be discussed in the context of academic mobility service.

3.1 Service Systems, Information Systems and Work Systems

Service system (SS) is a configuration of people, technologies and other resources that interact with other service systems to create mutual value [17]. Service systems as claimed by [18] are work systems. Work system is a system in which human participants and/or machines perform work practices using information, technology and other resources to produce specific products or services for specific internal and external

customers [19]. Operational information systems (IS) can be viewed as special cases of work systems [18] [20] which define IS as a work system (WS) whose processes and activities are dedicated to information processing by performing six types of operations which are capturing, transmitting, storing, retrieving, manipulating and displaying information [21] [22]. Specifically, IS exists to support one or more WSs [23]. In an environment of single WS, IS may provide information for decision making, structure or control the work or automate some of the work. While in a group of related WSs, the provided information may support information sharing, coordinate and integrate the work [21].

Computerized IS reliance has led to the increasing degree of overlap between WS and the IS that support them and these are represented in the overlapping models between WS and related IS are discussed in [20]. There are some situations where IS collects and organizes information quite separately from WS that uses its information. For example, prospect list extracted from websites are used by the marketing group to promote sales. There are other situations where an IS is identical to the WS. For instance, in the self-service e-commerce websites where customers identify possible purchases and enter their orders. There is also another situation as shown in Fig. 1 (a) where WS is integrated into a larger IS.

From the definition given, it can be concluded that IS is used to support work systems that produce physical products or services for customers as well as producing information products or services for customers. Besides being an information-centered system, IS also serve as shared infrastructure used in many diverse work systems [21]. IS and WS are highly integrated until when IS is separated, the WS cannot operate efficiently because it is controlled by IS. WSs act as fundamental of service systems. The common characteristic between WS and SS is they make use of available resources to perform work processes and activities to produce products or services that create value to the customers.

3.2 Service Triangle

The service triangle was coined by [4] to describe the linkages between the customer, provider and the reality in an organization. The tightness or looseness of the linkage among the components in service triangle represents the type of and sustainability of the service encounter and relationship [24]. The service triangle model is previously built for enterprises. Since, the role of universities are changing from traditional to modern administration, service triangle is appropriate to be adapted to portray the service relationship and interaction in academic mobility e-service.

The service is defined but not illustrated in the service triangle by [4] and was expanded from Peter Hill's initial definition. The service situation defined in service triangle is a socio-technical in nature [4]. Technical subsystem is carried out on the reality that is to be transformed, but the service target is framed by two types of social relationships which are the service interventions that initiate the ownership relationship and responsibility relationship. According to [4], a service activity is an operation intended to bring about change of state in reality C that is owned or used by customer B, the change being effected by service provider A at the request of B, and in many cases in collaboration with A, but without leading to the production of a good that can circulate in the economy independently with medium C. Fig. 1(b) illustrates the service triangle which shows the service relationships and actions among service provider, service customer, and service target.

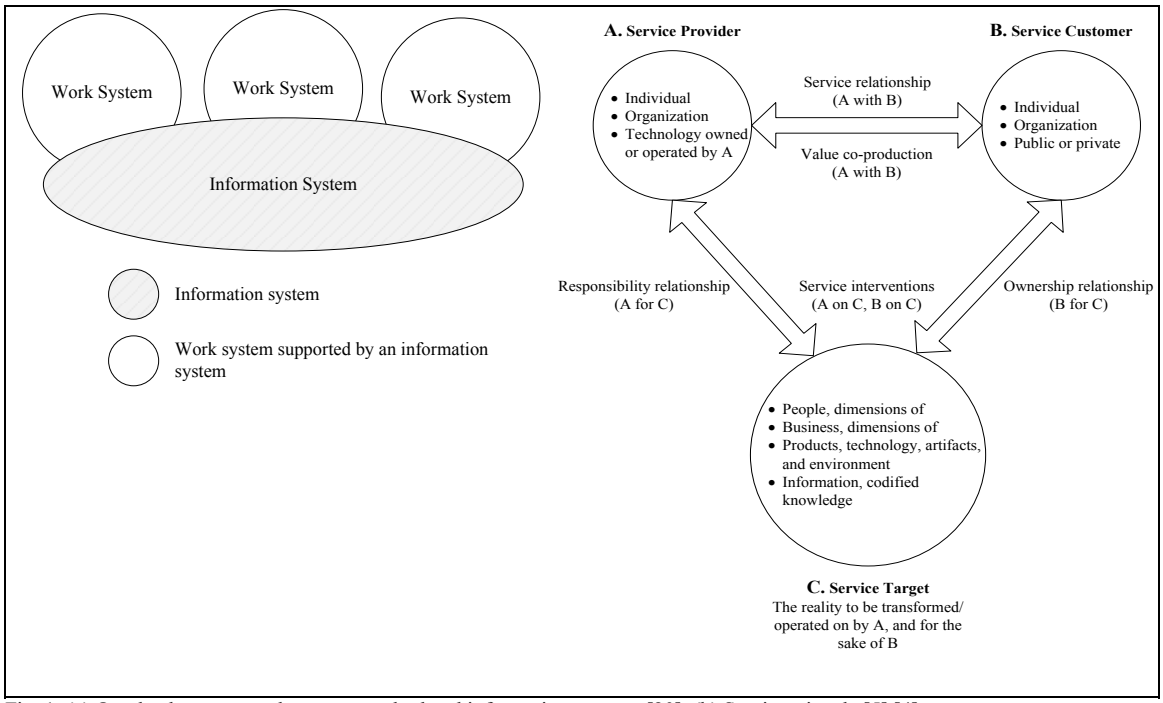

Fig. 1. (a) Overlap between work systems and related information systems [20]; (b) Service triangle [5] [4]

The work system by [20] was initially created to help business professionals recognize and understand systems in organization [18]. However, the work system framework has evolved from containing business process element to work practices element because work involves more than just steps [20]. Work practices are also dependent with information, technologies and participants.

4. Research Method

4.1. Overall Approach

The research was conducted using Malaysian universities as the case study. To conceptualize the academic mobility service as a service system, two methods of data collection were employed. The first method is a multi-stakeholder inquiry through personal interviews with representatives of the academic mobility service provider (university) and the academic mobility service customer (students). The service providers consist of representatives from the public and private universities which provide academic mobility (AM) program. The service customer is the students who had participated and went through all the processes in AM program. The work system method by [20] was used as a framework for inquiry. The second method is the document review of formal documents pertaining to academic mobility programs.

4.2. Data Collection

Details of stakeholders interviewed are summarized in Table 1 represent the service providers and service consumers of academic mobility service.

Table 1. Summary of stakeholders interviewed in academic mobility

Level of Stakeholders	Stakeholders Description	Interviewee Designation	CRM Level of Stakeholders
Service providers	Ministry of Education (MOE), Malaysia*	Deputy of Director In-Chief (Academic)	Strategic
	Malaysian Immigration Department*	Deputy of Director In-Chief (Immigration)	Strategic
	Universiti Malaya, Malaysia	Coordinator/Manager of AM Program	Tactical
	Multimedia University, Malaysia*	Coordinator/Manager of AM Program	Tactical
	Universiti Teknologi Malaysia	Assistant Registrar of Student Mobility	Operational
	Universiti Sains Malaysia	Assistant Registrar and the supporting staff of Academic Collaboration Unit	Operational
Service customers	Home University -University of Kent, UK Host University - Universiti Teknologi Malaysia, Malaysia	Inbound student	NA
	Home University - Universiti Teknologi Malaysia, Malaysia Host University - Seoul National University of Science and Technology, Korea	Outbound student	NA

** To be further analyzed*

4.2.1. Interview

Interviews are major techniques used to gather requirements from the actors in the organization [26]. To facilitate the interview and to ensure that the interview flow is always within the research scope, we prepared semi-structured questions according to the work system framework by [20]. The work system elements used are the processes and activities, participants, information, technology, environment, strategies and infrastructure. The interview questions are generated by focusing on issue of 5W1H which are 'what', 'where', 'when', 'who', 'why', and 'how'. Interview with both sides of stakeholders were conducted separately. The aim of the interview is to get the requirements of academic mobility services from the stakeholders' perspective. Table 2 outlines interview questions asked to the service providers of academic mobility service.

Table 2. Interview questions for service providers of academic mobility

Work System Elements	Questions
Processes and Activities	• How the academic mobility process is conducted? • What are the problems in the academic mobility process? • How long it takes to process the academic mobility application?
Participants	• Who are involved & what are their roles/concerns in the academic mobility process? • Who plays important roles in the academic mobility process?
Information	• What kind of information is required in the academic mobility application? • How the academic mobility information is managed? • How the information influence the academic mobility decision making?
Technology	• Are you using manual or online application system? • What technology is used in the academic mobility? • How the technology supports the academic mobility process? • How do you communicate with other stakeholders of academic mobility?
Environment	• What are factors that affect the operation & performance of the academic mobility process? • What agencies involved in the academic mobility process?

Strategies	• What is the future plan or expectation towards the academic mobility system? • Is there any recommendation that you can propose for improvements of academic mobility? • What are the constraints that limit feasible range of recommendation?
Infrastructure	• Is there any organizations information system that integrated with academic mobility system? • Is there any information shared with academic mobility system? • Is there any technical infrastructure shared with academic mobility system?

4.2.2. Document Review

The documents are reviewed from the website information of the universities, the brochure and the fact sheets. During the interview with representatives of the universities, the application forms and the documents pertaining to academic mobility procedure and process which are made available to the public and the academic mobility applicants given by the interviewee are also reviewed.

4.3. Data Analysis

The interviews transcription was analyzed to obtain important themes and comparison with the document review analysis was made. The sensemaking approach by [27] was used to make sense of the data by finding and sorting the themes in the data according to work system (WS) elements. Since we are in the preliminary stage of data analysis, we present the first cycle of the sensemaking approach which includes preservation and elaboration cycle of the WS framework. Interaction between the data and the work system framework is the main starting point and the centre of the analysis. To start with the analysis, we highlight the keywords that were repeated by multiple stakeholders and which are related to the WS elements. Once the keyword is identified, the whole sentences were copied. The sentences are organized and grouped into similar meaning to determine the themes. This step aims to detect data inconsistencies and gauge data quality to question the plausibility of the WS framework used. Then, we add and fill the data into the frame slots where we discover new data and relationships to elaborate the framework. In the next section we illustrate the description of the service relationship for AM and the service triangle.

5. Findings and Results

5.1. Thematic Analysis

The findings and results in this case study of academic mobility (AM) e-service in Malaysia by presentation of the themes and subthemes obtained. The themes identified from the data using thematic analysis and the sensemaking approach are shown in Table 3 from the service provider side.

Table 3. Summary of thematic analysis from service provider side

Themes	**Sub-Themes**	**Service Provider**		
		Universiti Malaya	**Universiti Teknologi Malaysia**	**Universiti Sains Malaysia**
Process	Procedures	Own guideline that comply with national law	Own guideline that comply with national law	Own guideline that comply with national law
	Application Process	Manual	Manual	Manual
	Funding	University's fund, student self-funding, Ministry's fund	Student self-funding, Ministry's fund	Student self-funding, Ministry's fund
Information	University	Examination result, progress	Progress report, academic	Progress report,

Required		report, academic transcript, IELTS/TOEFL results	transcript, recommendation letter, IELTS/TOEFL results	IELTS/TOEFL results
	Immigration	University's offer letter	University's offer letter	University's offer letter
Individual/ Agency Involved	Application Processing Personnel	Vice Chancellor, faculty, International Student Centre, Home University	Home University: registrar, faculty, bursary, International Student Centre, , Office of International Affairs, Graduates and Alumni Affairs	Home University: Registrar, faculty, bursary, International Student Centre, Home University, Student Affairs
	Enforcement Personnel	Immigration Accreditation Body Embassy	Immigration Accreditation Body Embassy	Immigration Accreditation Body Embassy
Technology	Processing	Manual system and internal database system	Manual system	Manual system
	Communication	Email, scanner, telephone	Email, mail, scanner, fax, telephone	Email, mail, scanner, fax

Due to the complexity of the higher education environment, many facets need to be considered before converting the existing processes of AM to e-service. By understanding the overall picture of the system consisting of service relationship, service stakeholders and service value, we identified the tasks that can to be allocated to machines and tasks that require human intervention. Here the description of the results from Organization-to-Student (B2C) environment is discussed.

The framing of academic mobility e-service is based on the empirical data from the interview with several universities in Malaysia. Several work systems performing work processes and activities of AM are supported by the larger AM information system. These components of AM work systems are derived from the interview under the work system elements of processes and activities. The integral of AM work systems and AM information system provides an AM e-service to create value to the stakeholders. For greater understanding, we illustrate the relationships of SS, IS and WS of AM in a graphical representation as shown in Fig. 2.

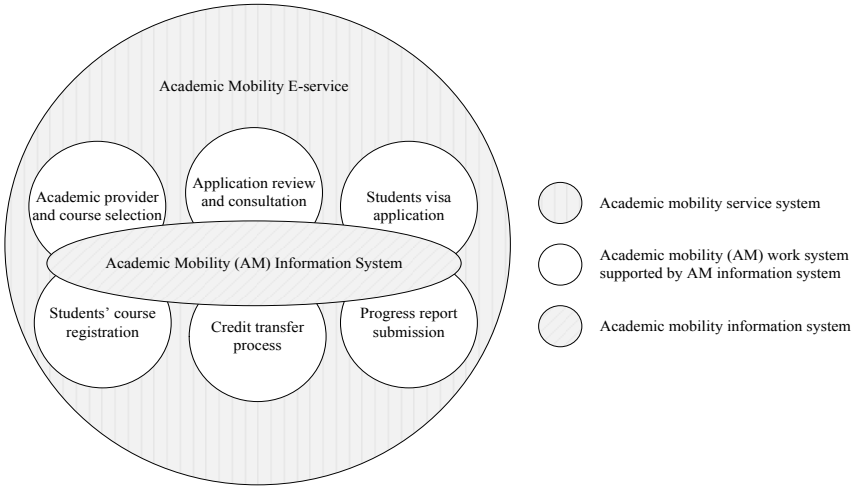

Fig. 2. Relationship of service system, information system, and work system of academic mobility e-service in Malaysia [20]

To gain competitive advantage an AM system must have the ability to scale up. Here we argued that AM processes and activities need to be transformed into e-service to improve the existing work practices. To develop an AM e-service framework, efficiency is our main dimension. AM being a service system allows information sharing such as the mobility students' feedback to compare the system's current state to previous state in terms of efficiency with other service systems [28]. To understand the components in a service in order to improve the operational process of academic mobility service, a model of service triangle of AM e-service is developed comprising of the service provider (A), the service customer (B) and the service target (C) (Fig. 3).

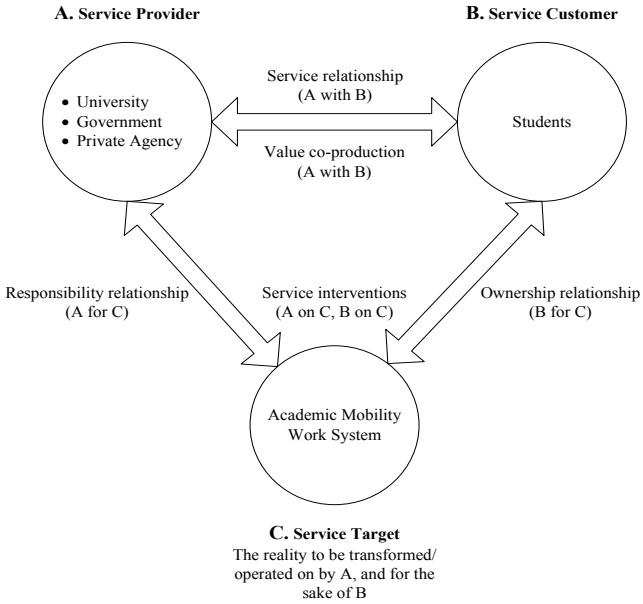

Fig. 3. Service triangle of academic mobility e-service in B2C environment (Adapted from [4] [5])

The service target in AM e-service which is the reality of AM work systems supported by information system needed to be transformed or operated on by service provider, for service customer who owns or uses the AM work systems. The service customers (B) in academic mobility e-service are the students who co-produce with the service providers to create mutual value by meeting their unique needs for services. Service providers (A) consist of the universities, government, and private agency that are responsible to affect the desired changes of AM e-service.

6. Conclusion and Future Works

This paper presented an understanding of service relationships to conceptualize the academic mobility e-service by viewing the degree of overlap between service system, information system and work system and the service triangle of service relationships and interactions. This understanding makes possible for the service scientists to understand the underlying service system's requirements. Future work will proceed with the next iteration of the analysis before the formal conceptualization of the academic mobility e-service.

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